Biomarkers and Mild Traumatic Brain Injury

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Impact of Mild TBI: Why We Should Care

- Reported as high as 20% of troops sustaining a mild TBI
- DOD and VA screening based on case definition of mTBI can results in underdiagnosis, overdiagnosis, and/or misdiagnosis
- Self report lacks specificity
- Overlap with PTSD Symptoms

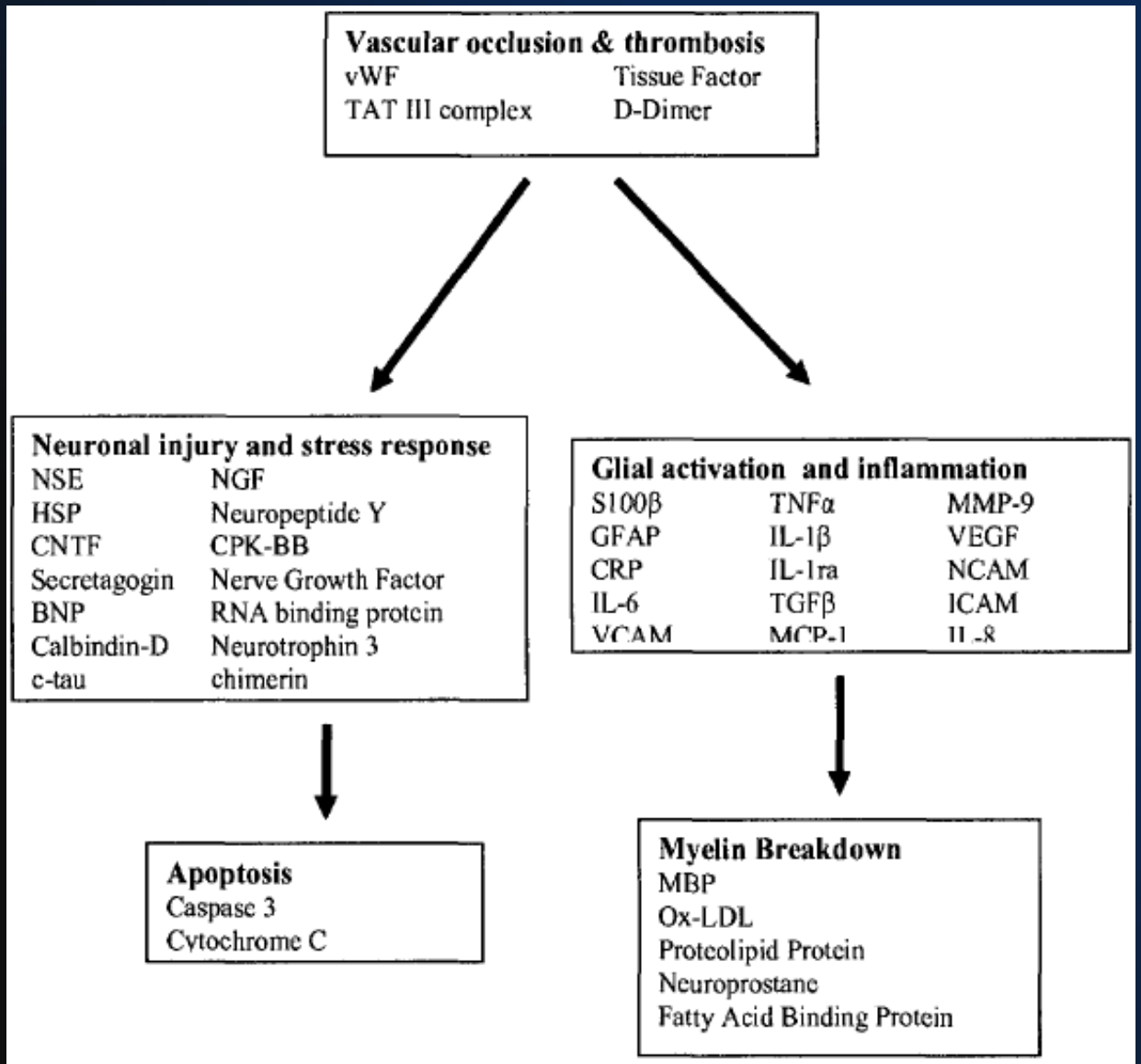
The role of biomarkers in acute diagnosis; What about mTBI as chronic disease?

- **Brain**
  - Multiple cell types and distributions
  - Cells with varying sensitivity to trauma
  - Cells with differentially localized elements (axons, cell bodies)
  - Blood-brain barrier limits access to vasculature
- **Heart**
  - Cellular homogeneity
  - Uniform cell distribution
  - Direct extracellular / vascular access

What is the ideal mTBI biomarker?

- A protein(s) released from injured neurons or glial cells
- Present in blood but not elevated in other conditions
- Rapid point of care platform-operator independent
- Sensitive to early trauma; low false negative rate
- Release patterns indicative of disease progression

Targeting Different Components of the Injury Cascade



Return to combat guidelines

- Most symptoms resolve after 7-10 days following blast concussion
- Early underreporting and later overreporting of symptoms
- Objective measures of cognitive function lacking
- Prospective studies needed (civilian and military) to validate screening tools and biomarkers in collaborative fashion